क्रम संख्या	उपग्रह का नाम	प्रमोचन की तारीख	परिणाम (सफलता, असफलता इत्यादि) असफलता के संक्षिप्त कारण
1	2	3	4
13	आई०आर०एस० 1 ई०	20-09-1993	प्रमोचक राकेट (पी० एस० एल० वी० डी-1) उपग्रह को कक्षा में स्थापित न कर सका ।
14	इन्सैट-1 ए	10-04-1982	इन्सैट-1 ए में हुई विसंगतियों तथा ईंधन समाप्त हो जाने के कारण असफलता हुई ।
15	इन्सैट-1बी	30-08-1983	सफल
16	इन्सैट-1सी	21-07-1988	डेढ़ वर्ष के पश्चात इस की पावर-बस में हुई खराबी तथा उपग्रह में हुई विसंगतियों के कारण असफलता हुई ।
17	इन्सैट- 1डी	12-06-1990	सफल
18	इन्सैट-2ए	10-07-1992	सफल
19	इन्सैट-2बी	23-07-1993	सफल

(ग) उपर्युक्त उपग्रह परियोजनाओं पर 490 82 करोड़ रुपये की धन राशि खर्च हुई है ।

Efforts for Developing Indigenous Cryogenic Engine Technology

96. SHRI S. S. AHLUWALIA : Will the PRIME MINISTER be pleased to state :

(a) whether it is a fact that in absence of the supply of cryogenic engine technology by Russia, persons engaged at the Indian Space Research Organisation have evinced confidence of evolving cryogenic engine technology indigenously within specific time frame ;

(b) whether Government have assessed the origin of thier confidence vis-a-vis the ground realities ; and

(c) if so, the details thereof ?

THE MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PUBLIC GRIEVANCES AND PENSIONS AND THE MINISTER OF STATE IN THE MINISTRY OF PARLIAMENTARY AFFAIRS (SHRIMATI MARGRET ALVA) : (a) Yes, Sir.

(b) and (c) The confidence of Indian Space Research Organisation (ISRO) in evolving cryogenic propulsion technology within a specified time frame is based on :

(i) The pre-project studies assessing the complexities ;

(ii) Development of 1 tonne class, pressure fed cryogenic engine;

(iii) Exposure on development of cryogenic stage for Geo-Synchronous Launch Vehice (GSLV);

(iv) Expertise created in ISRO, industry and academic institutions for earth storable liquid propulsion systems which can be suitably upgraded;

(v) Establishment of an operational liquid hydrogen plant,

Failure of PSLV

97. SHRI KRISHNA KUMAR BIRLA:
PROF. SAURIN BHATTACHARYA:
SHRI GHUFRAN AZAM:

Will the PRIME MINISTER be pleased to state:

(a) whether the country's most powerful rocket, PSLV, failed to complete its mission recently;

(b) if so, the reasons therefor;

(c) whether Government have ordered a probe into the causes of the failure; and

(d) if so, by when the successful rocket would be launched?

THE MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PUBLIC GRIEVANCES AND PENSIONS AND THE MINISTER OF STATE IN THE MINISTRY OF PARLIAMENTARY AFFAIRS (SHRIMATI MARGARET ALVA):

(a) Yes, Sir.

(b) While almost all the systems of Polar Satellite Launch Vehicle (PSLV) have worked satisfactorily till the end of second stage, the disturbances caused during the separation of the second stage from the third stage coupled with a software error under large pitch error conditions in the onboard computer resulted in the loss of control and changed trajectory. Notwithstanding, the third stage has functioned normally. The fourth stage also ignited as planned and developed full thrust as expected till splash down.

(c) The first few development flights are meant to prove the vehicle and the experience of failure in the first developmental flight is not unexpected. In spite of the failure to reach the final orbit, the success achieved in proving all the major systems and subsystems of the complex vehicle is noteworthy. A national level Failure Analysis Committee (FAC) has been constituted which is expected to give its final recommendations by 15th December.

(d) The second developmental flight of PSLV is planned during June, 1994.

WRITTEN ANSWERS TO STARRED AND UNSTARRED QUESTIONS SET FOR THE 3RD DECEMBER, 1993*

Loss due to Earthquake in Latur Maharashtra

*21. DR. BAPU KALDATE:
SHRIMATI KAMLA SINHA:

Will the Minister of AGRICULTURE be pleased to state:

(a) what is the estimated loss of life and property following the unprecedented earthquake in Latur Maharashtra; and

(b) what measures have been taken by Government to provide relief to the victims and also to give adequate financial and other assistance to the State Government of Maharashtra for relief operations?

THE MINISTER OF AGRICULTURE (SHRI BALRAM JAKHAR): (a) and (b) Government of Maharashtra have reported the following loss of life and damage to property due to the earthquake in some parts of the State on September 30, 1993:—

(a) No. of humanlives lost	—7601
(b) Estimated loss of property (Rs. in crores)	—300.00

*The sitting of Rajya Sabha on Friday, the 3rd December 1993 was adjourned as a mark of respect in the Memory of Shri Frank Anthony. Answers to Questions put down in the lists for that day were laid on the table of the House on Monday the 6th December 1993.